

AMENDMENT

(Amendment Based on Article 11)

To: The Examiner of the Japanese Patent Office

1. Identification of the International Application

PCT/JP03/08332

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4. Item to be amended: Claims

5. Contents of Amendment:

(1) The expression "a mold whose cavity is designed to set the shrinkage ratio of said resin molded article into a range of between 4.5/1000 and 6.6/1000," on page 37 line 6 in Claim 1 should be amended as "a mold whose cavity is designed to set X direction, Y direction, and Z direction molding shrinkage ratios of said resin molded article to be the same value each into a range of between 4.5/1000 and 6.6/1000,".

(2) The expression "a mold whose cavity is designed to set the shrinkage ratio of said resin molded article into a range of between 4.5/1000 and 6.7/1000," on page 37 line 17 in Claim 2 should be amended as "a mold whose cavity is designed to set X direction, Y direction, and Z direction molding shrinkage ratios of said resin molded article to be the same value each into a range of between 4.5/1000

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[Table 2]

Resin = ABS		Table 2-1	
Item	Unit	Value in Practice	
The temperature of the melted resin	°C	180	
The temperature of the mold	°C	45	
Injection pressure	%	70	
Injection speed	%	70	
Cooling time of the inside of the mold	sec	15	
Gas pressure	Mpa	25	
Gas injection position	Cavity		
Molding Shrinkage ratio (X,Y,Z)	‰	5.2	

Resin = ABS		Table 2-4
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	15
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	5.5

Resin = ABS	Table 2-7	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.4

Resin = ABS		Table 2-10
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10
Gas injection position	Cavity	
Molding Shrinkage ratio (X, Y, Z)	%	5.6

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	5.8

Resin # ABS	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = ABS	Table 2-11	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = ABS		Table 2-3
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	6.2

Resin = ABS	Table 2-6	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	65
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	6.0

Resin = ABS	Table 2-9	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin a ABS		Table 2-12
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	45
Gus injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

[Table 3]

Resin = HIPS		Table 3-1
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = HIPS		Table 3-4
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	6.6

Resin = HIPS		Table 3-10
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = HIPS		Table 3-2
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Resin = HIPS		Table 3-5
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X, Y, Z)	‰	5.9

Resin = HIPS	Table 3-8	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = HIPS	Table 3-11	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = HIPS		Table 3-3
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.7

Resin = HIPS	Table 3-6	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Resin = HIPS	Table 3-9	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = HIPS	Table 3-12	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	38
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	3.9

[Table 4]

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	5.5

Resin = modified PPE Table 4-4

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	15
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	5.5

Resin = modified PPE

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.5

Resin = modified PPE Table 4-10

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10
Gas injection position		Cavity
Molding Shrinkage ratio (X.Y.Z)	%	5.6

Resin = modified PPE	Table 4-2	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = modified PPE

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	‰	5.7

Resin = modified PPE

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	5.8

Resin = modified PPE Table 4-11

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X.Y.Z)	‰	5.6

Resin = modified PPE	Table 4-3	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.4

Resin = modified PPE Table 4-6

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	65
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	‰	6.1

Resin = modified PPE

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	‰	5.6

Resin = modified PPE Table 4-12

Item	Unit	Value in Practice
The temperature of the melted resin	°C	245
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	40
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	‰	5.6

[Table 6]

Resin = HIPS Fusing agent = AC		Table 6-1
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X Y Z)	%	6.8

Resin = HIPS Flame retardant = AC ¹		Table 6-4
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio	%	6.2

Resin = HIPS Elastomer agent = AC	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X, Y, Z)	%	7.3

Resin = HIPS		Table 6-10
Foaming agent = Sodium hydrogen carbonate	Item	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.9

Resin = HIPS Foaming agent = Sodium hydrogen carbonate		Table 6-13
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Resin = HIPS		Table 6-16	
Foaming agent = Sodium hydrogen carbonate	Item	Unit	Value in Practice
The temperature of the melted resin	°C	210	
The temperature of the mold	°C	35	
Injection pressure	%	99	
Injection speed	%	99	
Cooling time of the inside of the mold	sec	90	
Molding Shrinkage ratio (X,Y,Z)	%	7.3	

Resin = HIPS Forming agent = AC		Table 6-2
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.0

Resin = HIPS	Table 6-5
Foaming agent = ΔC	
Item	Unit
The temperature of the meshed resin	°C
The temperature of the mold	°C
Injection pressure	%
Injection speed	%
Cooling time of the inside of the mold	sec
Molding Shrinkage ratio (X, Y, Z)	%
	Value in Practice
	210
	35
	99
	99
	90
	6.8

Resin = HIPS Fusing agent = AC	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	180
Molding Shrinkage ratio (X, Y, Z)	%	7.1

Resin = HIPS			Table 6-11
Foaming agent = Sodium hydrogen carbonate	Item	Unit	Value in Practice
The temperature of the melted resin	°C		230
The temperature of the mold	°C		45
Injection pressure	%		99
Injection speed	%		99
Cooling time of the inside of the mold	sec		90
Molding Shrinkage ratio (X, Y, Z)	%		7.0

Resin = HIPS		Table 6-14
Foaming agent = Sodium hydrogen carbonate		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Resin = HIPS		Table 6-17	
Foaming agent = Sodium hydrogen carbonate	Item	Unit	Value in Practice
The temperature of the molten resin	"°C		210
The temperature of the mold	"°C		35
Injection pressure	%		99
Injection speed	%		99
Cooling time of the inside of the mold	sec		180
Molding Shrinkage ratio (X,Y,Z)	%		7.0

Resin = HIPS Forming agent = AC	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X, Y, Z)	%	7.3

Resin = HIPS Foaming agent = Al_2O_3	Table 6-6	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X, Y, Z)	%	7.3

Resin = HIPS	Table 6-9	
Forming agent = At _c	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	360
Molding Shrinkage ratio (X Y Z)	%	6.6

Resin = HIPS		Table 6-12
Banning agent = Sodium hydrogen carbonate		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X, Y, Z)	%	7.3

Resin = HIPS Banning agent = Sodium hydrogen carbonate		Table 6-15
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X, Y, Z)	%	7.2

Resin = HIPS Curing agent = Sodium hydrogen carbonate		Table 6-18
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	360
Molding Shrinkage ratio (X Y Z)	%	6.7

[Table 8]

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.9

Table 8-1

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Table 8-2

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.0

Table 8-3

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	15
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.7

Table 8-4

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Table 8-5

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.3

Table 8-7

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	180
Molding Shrinkage ratio (X,Y,Z)	%	7.0

Table 8-8

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	360
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Resin = AES
Foaming agent = AC

Table 8-9

Resin = AES Foaming agent = AC		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	65
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.1

[Table 9]

Resin = ABS

Item	Unit	Value in Practice
The temperature	°C	230
The temperature	°C	45
Injection pressure	%	70
Injection speed	%	70
Holding pressure	%	25
Holding time	sec	3
Cooling time	sec	25
Molding Shrinkage ratio	X axis direction	% 5.2 to 5.4
Molding Shrinkage ratio	Y axis direction	% 5.3 to 5.6
Molding Shrinkage ratio	Z axis direction	% 6.2 to 6.9

Table 9-1

Resin = modified PPE

Item	Unit	Value in Practice
The temperature	°C	210
The temperature	°C	45
Injection pressure	%	70
Injection speed	%	70
Holding pressure	%	25
Holding time	sec	3
Cooling time	sec	25
Molding Shrinkage ratio	X axis direction	% 5.4 to 5.8
Molding Shrinkage ratio	Y axis direction	% 5.2 to 5.5
Molding Shrinkage ratio	Z axis direction	% 6.1 to 6.9

Table 9-2

Resin = HIPS

Item	Unit	Value in Practice
The temperature	°C	240
The temperature	°C	45
Injection pressure	%	70
Injection speed	%	70
Holding pressure	%	25
Holding time	sec	3
Cooling time	sec	25
Molding Shrinkage ratio	X axis direction	% 5.4 to 5.7
Molding Shrinkage ratio	Y axis direction	% 5.3 to 5.5
Molding Shrinkage ratio	Z axis direction	% 6.2 to 7.0

Table 9-3

Resin = PC/ABS

Item	Unit	Value in Practice
The temperature	°C	230
The temperature	°C	45
Injection pressure	%	70
Injection speed	%	70
Holding pressure	%	25
Holding time	sec	3
Cooling time	sec	25
Molding Shrinkage ratio	X axis direction	% 5.0 to 5.3
Molding Shrinkage ratio	Y axis direction	% 4.9 to 5.1
Molding Shrinkage ratio	Z axis direction	% 5.6 to 6.5

Table 9-4

[Table 10]

Resin = PC/ABS	Table 10-1	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X Y Z)	%	5.1

Table 10-1

Resin = PC/ABS	Table 10-2	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X Y Z)	%	5.7

Table 10-2

Resin = PC/ABS	Table 10-3	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X' Y' Z')	%	6.4

Table 10b3

Resin = PC/ABS	Table 10-4	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X Y Z)	%	5.4

Table 10-4

Resin = PC/ABS	Table 10-5	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X Y Z)	%	5.6

Table 10-5

Table 10-6		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gass pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X Y Z)	‰	5.9

Table 10-6

Resin = PC/ABS	Table 10-7	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X Y Z)	%	6.6

Table 10-7

Resin = PC/ABS	Table 10-8	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X Y Z)	%	5.7

Table 10-8

Resin = PC/ABS	Table 10-9	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X Y Z)	%	5.2

Table 10-9

Resin = PC/ABS	Table 10-10	
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10
Gas injection position	Cavity	
Molding Shrinkage ratio (X Y Z)	%	5.7

Table 10-10

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X, Y, Z)	%	5.8

Table 10-11

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	38
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Table 10-12

[Table 11]

Resin = ABS

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Table 11-1

Resin = ABS

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Table 11-2

Resin = ABS

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Table 11-3

Resin = HIPS

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Table 11-4

Resin = HIPS

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Table 11-5

Resin = HIPS

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	6.9

Table 11-6

Resin = modified PPE

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Table 11-7

Resin = modified PPE

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Table 11-8

Resin = modified PPE

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	6.4

Table 11-9

[Table 13]

Resin = PPE modified HIPS in which St-g-B is added		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.5

Resin = PPE modified HIPS in which St-g-E is added		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = PPE modified HIPS in which Preprec P-150B is added		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.4

Resin = PPE modified HIPS in which St-g-F is added		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = PPE modified HIPS in which St-g-F is added		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = PPE modified HIPS in which		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = PPE modified HIPS in which St-g-B is added		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	6.6

Resin = PPE modified HIPS in which St-g-F is added		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	6.6

Resin = PPE modified HIPS in which		
Item	Unit	Value in Practice
The temperature of the melting resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	6.6

[Table 14]

Resin = ABS		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Table 14-1

Resin = ABS		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Table 14-2

Resin = ABS		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.3

Table 14-3

Resin = HIPS		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.1

Table 14-4

Resin = HIPS		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.3

Table 14-5

Resin = HIPS		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Table 14-6